

O-Engineers

September-2017, 2nd issue

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DREAMS

Don't

Work

Unless

YOU Do.

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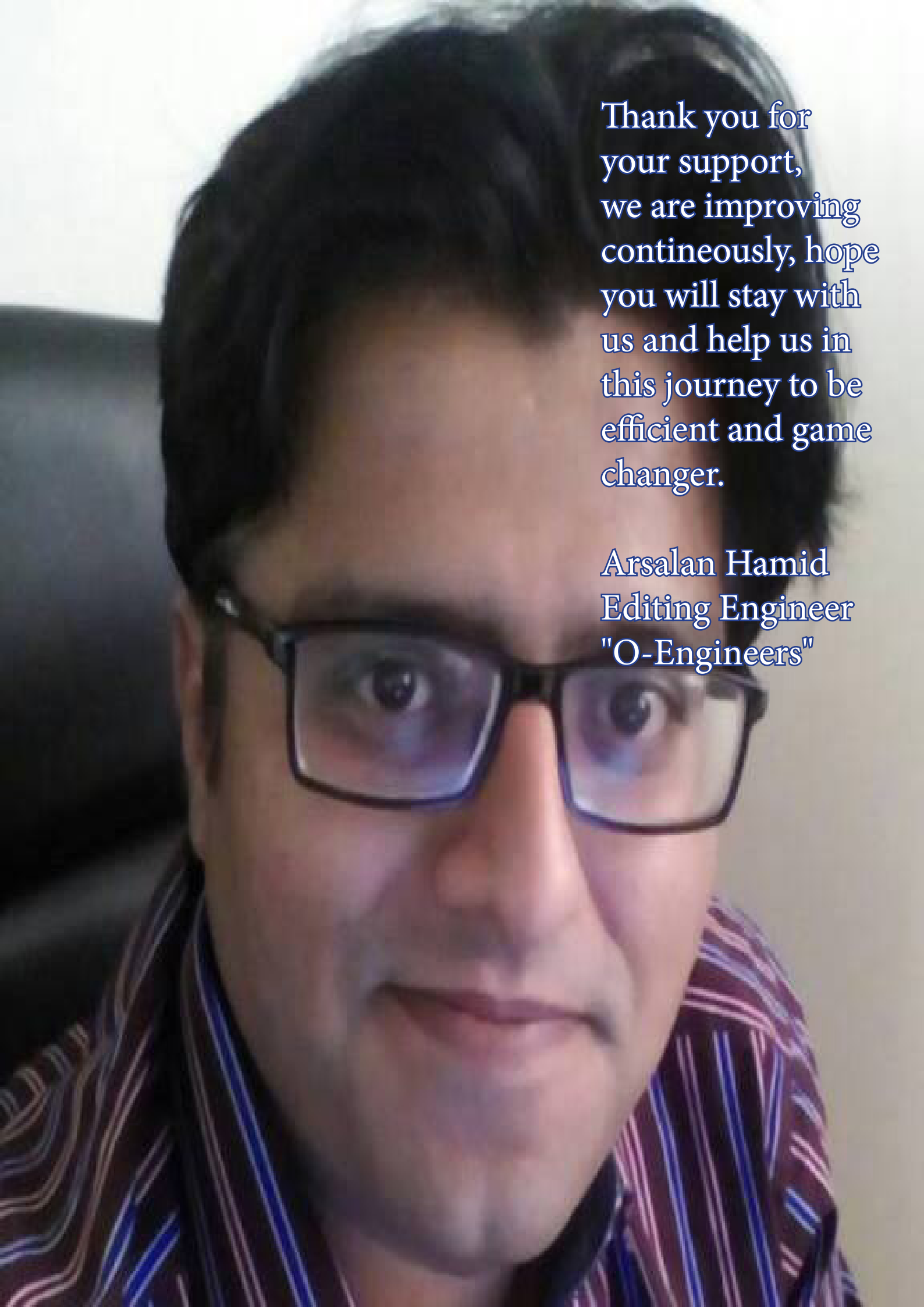
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Thank you for
your support,
we are improving
continuously, hope
you will stay with
us and help us in
this journey to be
efficient and game
changer.

Arsalan Hamid
Editing Engineer
"O-Engineers"

Feed Back-1st issue

Appreciated informative, Thanks for
sharing

(Engr. Wajahat Saeed)

I think this is the beginning so that's
why content was not satisfactory. Please
improve

(Engr. Irfan Qalamkar)

thank you allah bless you :)

(Engr. Kais Alvi)



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Via Papini, 2
Castelnuovo del Garda, Verona, Italia
Tel. 045-6450856
Fax. 045-7571983
mail: info@saelettrica.com
www.saelettrica.com

What is Method Statement?

Editorial Team-CarpediemTech

Method Statement is also known as safe system of work. Engineer while making method statement must take few points in consideration

like

- Hazard involved in executing job
- Step to step Guide for doing job safely
- Control Measures with clear central ideas

Why we need method statement?

Answer is So simple, purpose is to

- Cinform CClient or Project Owner or Tender client that applicant understsnd the work scope
- Know the existing and upcoming challenges in project

- Know how to overcome the challenges in project
- Know about the interface problems while more than a single contractor is working on project
- Know about safety procedures in consideration during project
- Get justification about cost estimations of large scale activities in project

Quality Management system is tool which informed About the situations where method statement is more critical than any other documents or procedures of project

Why Contractor need Method Statement?

- To get qualified for the tender
- To Identify the dates where related information is require from project owner or stakeholder or client
- To get indicated when instruction is required for dealing with nominated subcontractors and provisional sums
- To Explain the limitation of temporary works

Outline Method Statement for New Offices for Fast Transport PLC North Lane, Stansford

Site location	The project is located in the existing transport yard of Fast Transport PLC, North Lane, Stansford. Access will be through the main entrance gate.
Restrictions/ Access	Incoming traffic will be directed to use the north access road and will leave the site along the road next to the canteen. The live oil and gas mains will be protected during the contract period and the fibre optics cable will be carefully exposed by hand dig and protected in accordance with the specification prior to piling equipment entering the site.
Sequence of work	Our tender programme T354/P1 shows the preferred sequence of activities. The aim is to start at the east end of the building progressing to the west. The site will be filled with a stone layer on a ground improvement mat immediately after the site is levelled. Concrete floors will be started after the columns have been cast and before the upper floors are constructed. External paving will be carried out in the last quarter of the contract period. The drain connecting manhole 3 to the existing foul sewer will be completed early to provide disposal from temporary facilities.
Design development	Detailed drawings of the roof cladding will be produced by our specialist sub-contractor. These will clarify the scope of the work giving fixing details, sequencing and weathering procedures. Roof flashings will not be made until formal approval has been received by our sub-contractor.
Temporary works Safety	An independent scaffold will be erected to each external face of the building, and a mechanical hoist will be provided near the north-west corner. Anyone working on or visiting the site will be required to wear safety helmets and operatives will use other protective clothing depending on the type and location of work. The sides of the drain trench next to the oil tank will be supported with trench sheeting and we will provide barriers next to all excavations where a danger exists. The agent will attend regular meetings with the planning supervisor and cooperate with site regulations to maintain the client's good safety record. The health and safety plan will be developed by our construction team prior to starting any affected works, and sub-contractors will have contributed to any relevant planning for their works. The health and safety file will be prepared as the project progresses. The safety performance of the site is monitored by line management who report to regular safety audit meetings; and external consultants inspect our compliance with current legislation at intervals of no more than three weeks.
Supervision	Our management structure for the project is shown in the diagram attached. We will adopt a flexible approach to site supervision, providing sufficient operatives in suitable disciplines to meet our programme requirements.
Quality plan	The site manager will be responsible for drawing up a quality plan for the project with assistance from the area planning engineer. The control and monitoring framework is given in the company's general procedures and QA manual.

Method statement consist of

- Project Location and Environment
- Restriction
- Work Sequence
- Engineering and Designing work
- Temporary works Safety
- Supervision
- Quality Plan

We model one example on page 3 for reference point of view and better understanding of the topic and terms.

Editorial Team Intend to give the short and simple insights about this important feature of any tender bidding phase.

hope this will fulfill the main requirement of this article. We will extend our research in this area and continue this series so it will be helpful for the engineers working in tender department of their organizations.

Fear of Research or misconception about Research in organizational Development?

Engt. Qazi Arsalan Hamid

After serving in different multinational organization on different level, I just observed that we have big issues at middle management and upper management in research areas,

upper management assigned and considered research tasks as time oriented and middle management took it as paperwork or simply some less important improvement sheet.

I am amazed to see the progressive growth of Japan and Germany which they did after World War 2 destruction, and believe me or not this progressive growth is just because of research and development in all possible area of industrial education.

I read biography of jack welch the manager of the 20th century when someone asked what he did to transformed the nearly bankrupt General Electric Industry into world best organization, you knew what is his reply was?

Jack said “I did not do anything I just developed GE’s training institution”, Training institutes provides the base of research and development in any organization,



but unfortunately most organizations are not paying attention on their training institutes, first you hired trainees then without any specific industrial training you just enforced them to do assigned task and when they did it wrong , the best solution is to cut them off from hierarchy....

I observed the impact of research and development in many low profile organizations, also saw consequences of failure to adopt trend of Research and Development in big organizations due to lack of involvement of Executive management, we did research on effective use of earth fault indicator in our distribution system and guess what we got? We save lot of money when we implemented the proven method of research, as per one unofficial estimation we saved ten million rupees per annum in terms of

- Transportation
- Correct Fault Tracing
- Short term power Failures

We not only get exact location of earth fault in system, but also ensure prior maintenance activity on affected area.

My one fellow manager did research work on knife switches or air break switches, but unfortunately his work did not get appraisal and acceptance from his higher ups (unfortunate bureaucracy and office politics tricks) and his utility is still losing lots of money in terms of

- maintenance
- Large area Power outage

This research on knife switch also ensures maximum safety at the time of operation.

Another fellow manager informed they did complete CYMDIST study on “loop system capacitor placement for power factor improvement” in multiple urban areas (where power factor is as low as 0.65 as compared to rated 0.95), but the study was rejected and the failure of capacitor placement on the basis of this research work and load flow study

results in nearly million rupees loss to company annually. His Organization's management consider this research work on existing system just waste of time and mostly peoples assigned as lead for these studies or research projects, are mostly in surplus or irrelevant to research project's central ideal.

Human mind have solutions of many problems and reengineering is one of them, but it is most expensive procedure, that is why experts said reengineering is never a good option, we can improve by involving professionals in research work, by doing this companies will not only save money but also can win many new challenging projects, in bidding of these new upcoming projects the research work results will make difference.

Last but not least, I request most of our professionals to encourage freelance researchers, they atleast try to change the research trend and if possible kindly provide platform for them.

Insulation Resistance Testing

Engr. Qazi Arsalan Hamid & Engr. Hui Yuantao

It is done by insulation Tester, we mostly use megger insulation tester device for it, we measured rated resistance for our own safety, and insulation is point where we can operate any equipment with safety assurance

Device has 3 contacts

- Line contact
- Earth Contact
- Guard

Megger insulation Tester:

2.5KV, 5KV and 10KV IR tester is available in market for testing of Electrical equipment, it inject DC current to measure Resistance in any circuit.

In some equipment line contact is designated as positive, earth contact as negative but guard contact remains guard contact. Very simple operation, which will be connected to electrical equipment, so

Insulation resistance will be measured, V is the voltage applied via megger IR tester, this voltage is generated by small built in generator in megger, due to applied Voltage current flow in circuit,



and due to this flown current and applied voltage we can easily detect resistance, Now let suppose we apply 10Kv and get reading of 10T ohms, its means 1 nanoAmperes, Which means it is far safer for the

operator, Now we need to see what is the need of guard?

Look when we testing any equipment, we inject 3 currents in circuit

- Charging current
- Absorption current
- Leakage or conduction current

Charging current is for the capacitance of under test insulation object

Absorption current is flow in the insulation material
Conduction current is further divided in two parts

- Current flows in outer surface of insulator
- Current flows in conduction path of the insulator

When we are testing any equipment, we are more concern with the current flows in conduction path of the insulator but not the current flows in outer surface of insulator

Now what guard is doing, guard is actually a shunt circuit, when we connect our insulator tester in our circuit, the guard will carry out that outer surface current and isolate

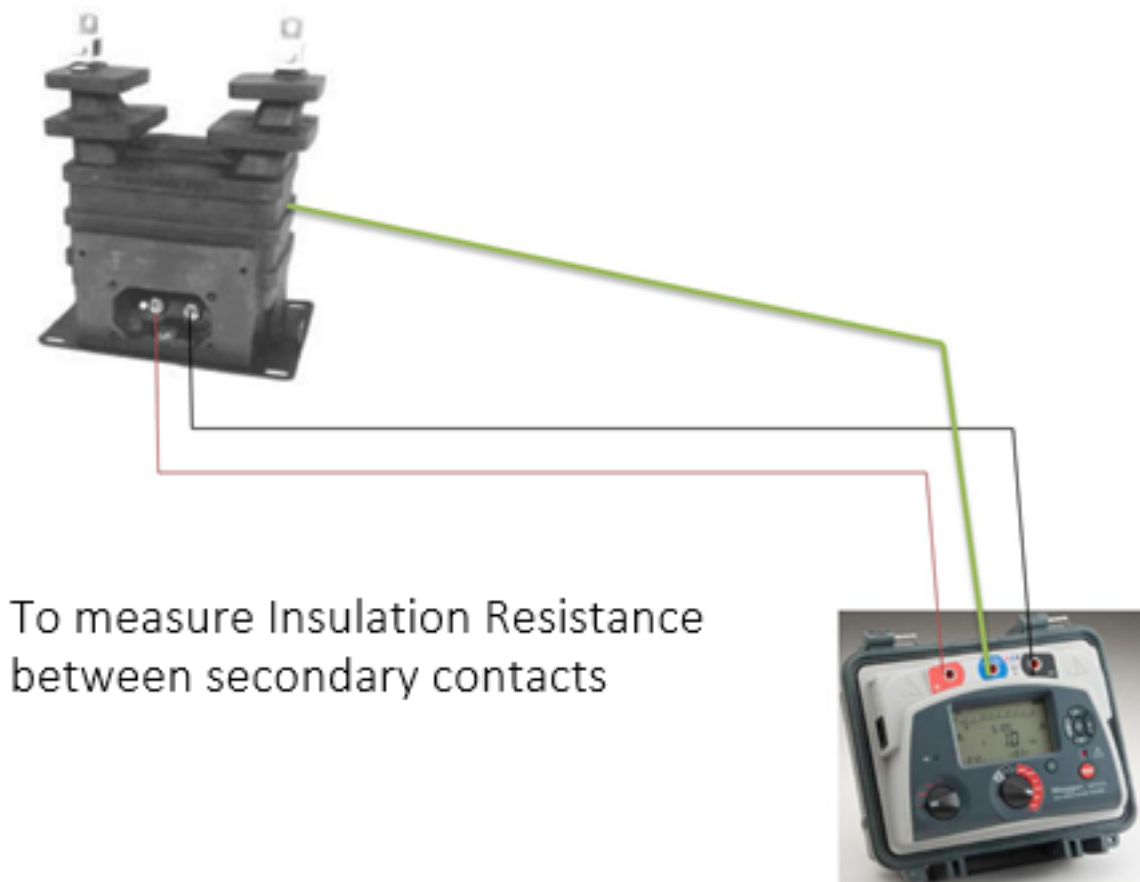
it from measurement in insulation resistance measurement, and we will get the exact reading of resistance in the conduction path of insulator. This is our main aim. Now question is that why we need it, sometimes due to moisture or rain, the resistance of outer surface reduces and can affect the Insulation resistance of insulator which is under test and give us wrong reading and on basis of which we will replace our insulator, which is economically wrong.

As we discussed earlier, outer surface of insulator is parallel path to the conduction path of insulator.

When we apply IR tester without guard, our reading will be 0.0952 ohm, Now let suppose after next two or three days we need to conduct this test again, asked by client because of corrective maintenance and during these past two days, weather changes and rain was fallen , now outer surface resistance is reduces , because our insulator is now wet and always remember wet insulator resistance is always less. Now our IR tester gives us reading 0.00995 ohm which is differed from actual value 0.0952 ohm.

This will influence client to replace insulator as resistance decreases by significant percentage. Now if we employees the guard in our testing, our IR tester

Outdoor PT



reads 2Mega Ω in both conditions means pre and post rain/pre and post moisture state of insulator.

Application Level

- For low voltage system, we can use 0.5-2.5KV Dc IR Test Set
- For Medium and high voltage we can use 2.5KV 5 KV DC IR Test Set
- For Extra high voltage , Recommended is 10KV



CONTACT US

Enpak2017@gmail.com



O-ENGINEERS

SINCE AUG 2017

Problems of fresh Engineer

Engr. Sidra Naeem

All I wrote here is based on my personal experience, as topic described it is all about the issues related to the fresh pass out graduate and registered engineer (sorry to say registered, but we engineers are bound to have certain

credential from the body called PEC which is till date not democratic and did not do anything in favor of engineers). I took various universities pass outs point of view in it.

The main issue is the absence of career counseling of newly pass out engineers, this is impractical way of teaching in universities by outdated professors , another one is the absence of motivational learning courses in our educational system , in my opinion the last one is the low level interest of equipping understudy engineers by industries in our system.

Impractical way of teaching in universities is the main reason of student's lack of interest in their fields, their teaching style forced them to think about passing of exams only and not on skills development , students

always think that whatever their teacher has advised them for learning is enough for practical approach . Although most of the teachers are not making any new advancement in courses, my teacher of complex variable was real a complex man himself, he never informed us about involvement of taught equations in any field, Power electronics teacher was full of power but only physically, he never gave us the hint about the practicability of taught theorems. Our Universities labs are out dated, always waiting (like majnu waited for Laila) for upgradation on the basis of grants from government or foreign aids agency, in one university I saw a board out of lab that “students are not allowed”, this is simply a joke that the person who after completing education will enter in the job world (which is completely resembles the running laboratory)but in education and pre-learning years he / she is prohibited to make mistakes and gain experience in Universities lab . After all this please see the marks of lab activity in your courses, that is barely 25 to 35% of credit hours, means 65 to 75 % theory, I hope Aristotle and Plato will definitely feel happiness when they heard that Pakistani universities adopted their theoretical way of educating the future combat, nuclear, distribution, chemical, mechanical, electrical,

process engineers. Lab teacher attitudes are not so practical, most of them were new incumbents or professors who are not fit for class lecturer category. Profitability criteria in each profession also affected the education system of Pakistan, by the time of my education maximum students in any class or section was between 70 to 80 , now in the current scenario it has increased up to 130 to 150. Now imagine you are a lecturer and you have audience of 150, you will definitely feel like you are performing in front of theater audience, but not teaching the future of Pakistan, and what about the lab lecturer , how can he/she practically deliver his / her knowledge in front of 50 to 150 students at a time.

This must need some improvement, we can rearrange our education syllabus by implementing 50-50 percentage ratio in theory and practical aspects of subject. We can implement a policy of 50 students per section (not class, class may be divided in further section). We can train our teachers to focus more on present and future technologies, currently new research is available completely online, freethinkers are not charging any fee for their books, and many websites are lade with thousands of innovative books.

For example

www.freebookspot.es

www.libgen.org

www.booksc.org etc.

Absence of motivated learning courses is the second most important problem, many professionals present that theorem that you will get job and retain it on the basis of your communication skills (communication skills will be 85% responsible for your job security), but as we observed our syllabus we found not a single motivational learning or communication skill course, I was only motivated by studying power generation economics, because teacher never came prepared to deliver lecture and allowed us to leave class during lecture time, one student told me that his department arranged one day seminar on motivation, the motivation lecture was out dated and mostly a copy from presentations of Steve Jobs and others, the seminar presenter mostly concentrated on the passions and values, but the whole lecture was out of reasonable examples and our scenario examples. These one day seminars are just wastage of time, no man can learn something in one day we need to introduce the particular communication and motivational

course in our syllabus (please note by communication I do not mean English dersi grammar). In some universities administration introduced the presentations by students system , look it is like something is better than nothing but you have to train them for ways to deliver a presentation , I saw many presentations of fresh engineers , most of them were like lurch (the butler character of Adam family) delivering presentations like they were answering the calls of their owners. This lack of communication also downsized the confidence of a person, once we were taking a interview of fresh pass out and when we asked questions he did not reply any of it, we wished him good luck and asked him to wait for our decision, when he came out his first sentence to his colleagues were “how could I answer, they did not informed me that a woman is also in the interview panel”.....poor creature. How can I blame him? It is simple that he was not trained for such type of environment.

Absence of career counseling, we can say this is the only problem which is larger than all. No one is there to advise young Engineer, this loophole cause anxiety in pass out engineers when his/her first priority is to get job anywhere , no matter what will be the impact of field in his/her future.

Many electrical engineers are seen working in the computer field and many telecommunication engineers in electrical fields, even many engineers working as clerks and lower management post because they just want a job irrespective of field, one of the biggest organization nowadays hired engineers and then their first job assignment was billing in particular areas , when these engineers joined office the first day they thought of new engineering techniques and experiences and at the end of day they found themselves holding wireless or bill recovery plan in their hands (condition is like movie song Kya say kya hogaya). If we want to solve this issue, the first step is to develop career counselling centers for fresh engineers, please do not think any other governing body will do this because they do not have capabilities and any interest in it at all.

Less interest of equipping understudy engineers by current industries, I never understand why industries are not taking any interest in the future engineer, the future or understudy engineer who will be responsible or turning point for their own growth. Industries are providing internships, but what these internships means. They just inducts few interneers and pull them in their running system without attaching them with any instructor. I saw by my eyes that 5 interns were working with engineers in steam turbine overhauling

if they were asked any questions the reply from the workers was don't you see we are busy. When one intern tried to see over hauling from a close point one of the engineer at work would bark "abay kya engine main gusay ga".this is a severe attitude towards unprotected workforce from the professionals, professionals adopted such attitude because they knew no one from industrial management would really care about these interns and this is not their part of job or assignment to train them. The solution of this problem is to establish a field curriculum for new interns and fresh engineers, industrialist cannot do this but their respective organizational learning department can do this with the help of experienced engineers, the main advantage of this curriculum is to polish the skills of new comer and make them efficient and productive part of organizational structure.

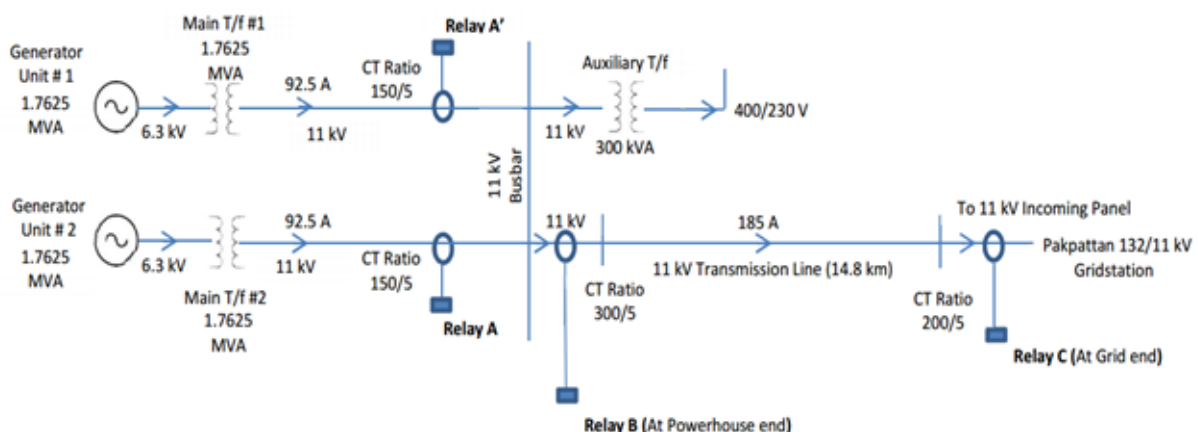
These points are my observation only, nothing else.



OC Protection & Co-ordination of 11kV Interconnected Transmission Lines

Engr. Noman Muhammad

An Interconnection Study Report was approved for 2.82 MW Pakpattan Hydropower station and 132/11 kV MEPCO Grid Station in order to evacuate power to the national grid system through 11 kV Transmission lines, installed with the overcurrent & earth fault protective relaying at each end. protective relaying is shown as under;



Operation coordination & calculation of relay settings for 11 kV interconnected Transmission lines i.e

- Relay B: Feeder Relay at Powerhouse end
- Relay C: Feeder Relay at grid end

The electricity generated from the interconnected facility is supplied to the national grid through 14.8 km long 11 kV Transmission lines. The electrical output power generated from each synchronous generator is stepped up with respective rated current contribution of each generator as 92.5 A.

The current contribution of both the generators is pooled in on 11 kV common busbar at powerhouse facility from where the electrical power is then evacuated to the interconnected grid station. For stable and reliable evacuation of 2.82 MW of electrical power from powerhouse to the national grid, it is necessary that relay settings at both the ends are properly coordinated otherwise indiscriminate trippings may occur.

For simplicity, only the overcurrent settings will be calculated out for line Relays “B” & “C” such that the protective relay “C” at grid end would operate first in case of the overcurrent faults and protective line relaying “B” at power house end, acting as second line of defense will operate after a preset time delay if relay “C” protection fails to clear the fault.

The desired operation could be achieved provided that current & time settings for Instantaneous, IDMT & Definite time overcurrent relay protections at both the ends are properly coordinated.

Summarized results of relay settings in this respect are tabulated as under;

S.NO	Type of Relay Protection	Relay A	Relay A'	Relay B	Relay C
1	IDMT Overcurrent Protection	-	-	$I_{IDMT(S)} = 3.67 \text{ A}$ 1.10 times 200 A TMS = 0.31 CT ratio: 300/5	$I_{IDMT(S)} = 5.5 \text{ A}$ 1.10 times 200 A TMS = 0.1 CT ratio: 200/5
2	Definite Time Overcurrent Protection	$I_{(s)} = 4.21 \text{ A}$ 1.36 times 92.5 A t = 1.5 sec CT ratio: 150/5	$I_{(s)} = 4.21 \text{ A}$ 1.36 times 92.5 A t = 1.5 sec CT ratio: 150/5	$I_{(s)} = 4.33 \text{ A}$ 1.30 times 200 A t = 1 sec CT ratio: 300/5	$I_{(s)} = 6 \text{ A}$ 1.20 times 200 A t = 0.5 sec CT ratio: 200/5
3	Instantaneous Overcurrent Protection	-	-	$I_{(s)} = 18.33 \text{ A}$ 5.5 times 200 A t = 0 sec CT ratio: 300/5	$I_{(s)} = 25 \text{ A}$ 5 times 200 A t = 0 sec CT ratio: 200/5

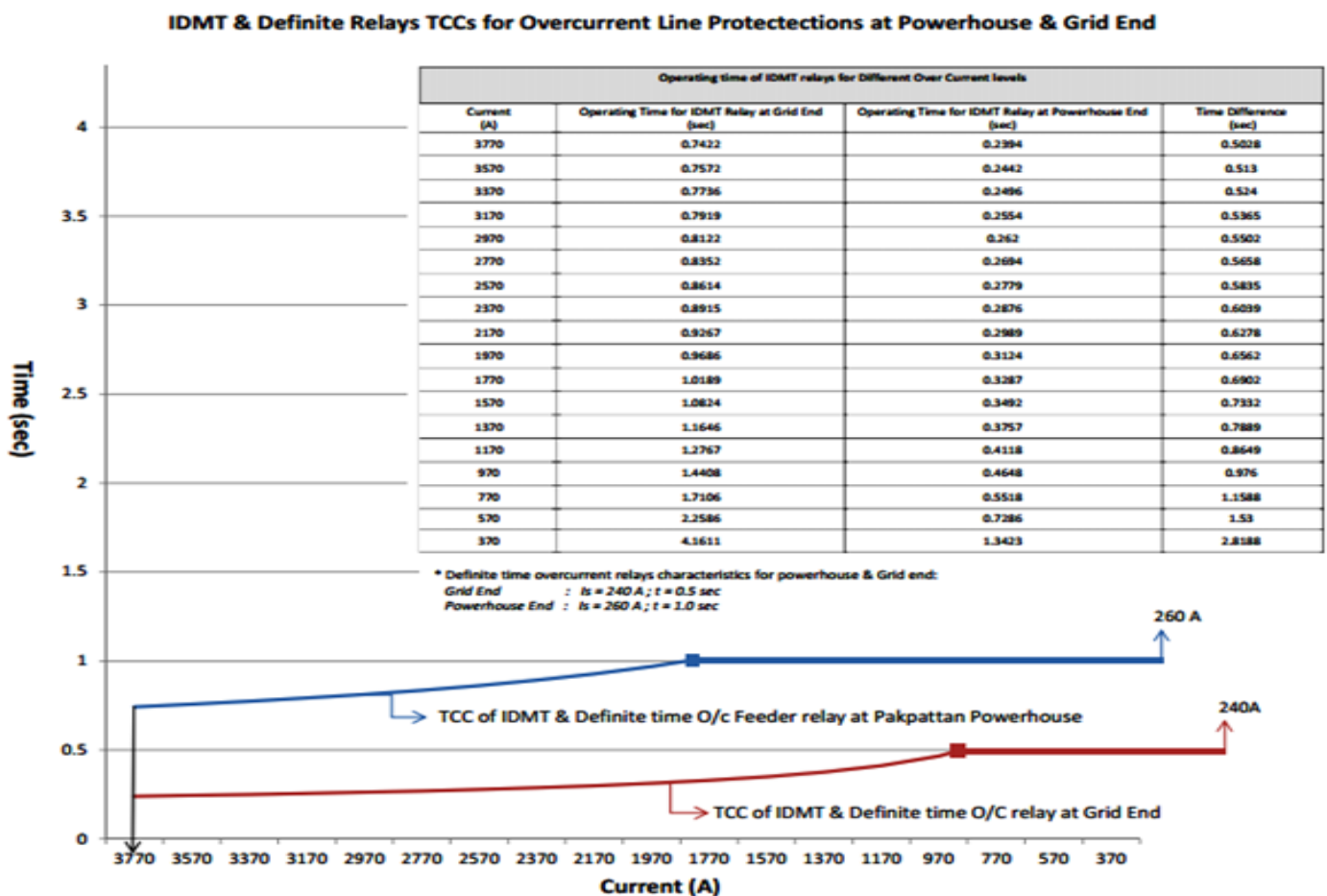
Note:

Time characteristics of TCCs for IDMT Relays B & C are calculated according to the Standard Inverse characteristics as given in IEC 60255.

The time operating characteristics of both the Relays “B” & “C” are also plotted in the form of TCCs to rationalize whether the protective relaying scheme is adequately coordinated or not against the above mentioned relay settings. For this purpose, the operating time of overcurrent protections (Instantaneous, IDMT & Definite) of both the

relays have been worked out at various fault current levels in accordance with IEC 60255 and then the results are plotted in the form of time current curves, which are shown as under.

The TCCs clearly indicate the operating time of relay “C” at different fault current levels as well as the corresponding time difference indispensable for the operation of Relay “B” in case when grid end relay “C” fails to operate, hence concluding that the protective relaying scheme is adequately coordinated and will not cause any indiscriminate trippings.





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***Engineer
Who Fought
Back
Engr. Niaz***

Niaz Hussain Panhwar is Switchgear Engineer, Nowadays serving in Saudia. He was victim of “Qualified but Job Lost Syndrome” of immature Management Twist of one of the leading organization of Pakistan.

After starting his career in one switchgear company as trainee engineer, he moved from cadre of trainee to regular engineer after serving efficiently in his organization. During this transition he got offer from one of the leading Electric Utility of Pakistan, after consulting from seniors he got



released from his current switchgear company and accepted Utility offer as trainee engineer for the period of 6 month, after which successful and talented candidates got permanent position in Organization as Assistant Manager. Mr. Niaz Told me: I was performing good in all assigned projects, my seniors appraised me and appreciated my professional growth. After 6 month of training they were assessed and told that they will be contacted shortly. Niaz told “We were excited to get appointed in such a precious organization, also our performance was quite good”

Three month passed no one contacted, and when they contacted the HR department, they were informed that management was changed and new management was not interested to hire them, out of 60 trainees only 7 trainees were hired through "different channels" and links, Niaz informed that it was like trauma we left our previous jobs for this opportunity and now we were even not worth to get management reply. This was transition period in Pakistan and government were changed, no one in utility was ready to answer the calls and appeal of fired Trainees.

Niaz said “ I was disappointed , my career was at stake,

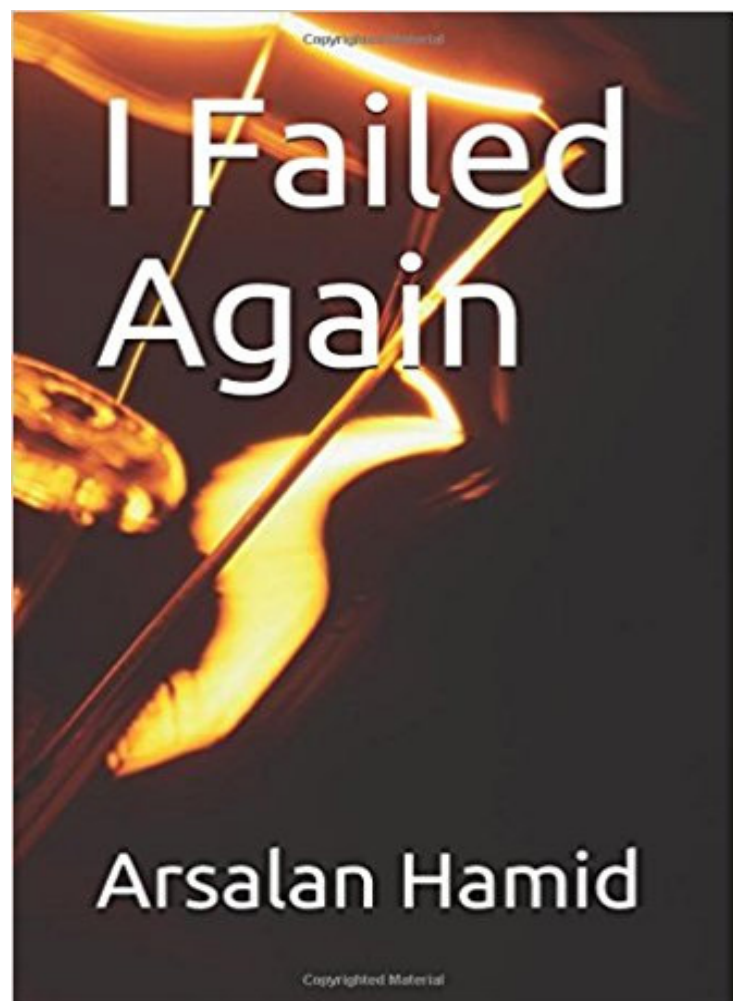
and relatives thought that it was all my fault, but I raised from my disappointment and started my searching for job again , after intense struggle and multiple applications, I got call from my previous employee, they were interested to take me back as my performance were satisfactory , I joined them and now after 8 years of this whole career twist, I just remembered how much I was damaged and how I did not allowed myself to fall completely, I stand when



others lies I relearn the lesson of life to always be struggler not be loser, now I am Senior Switchgear Engineer in one of leading Saudi Firm.

Book for this Month

The book is about career counselling for the Engineers and Professionals, just 88 pages and about 2 hours of reading will suggest you new paths in your career development.



enpak2017@gmail.com